

Determination of Solid-Liquid Equilibria Data for Mixtures of Heavy Hydrocarbons in a Light Solvent

R. M. Roehner,* K. Ramanathan, F. V. Hanson, J. V. Fletcher
University of Utah, Department of Chemical & Fuels Engineering,
Merrill Engineering Building, Room 3290, Salt Lake City, Utah, 84112

* Presenting author: E-mail: R.Roehner@m.cc.utah.edu

Abstract

A recently developed novel FT-IR spectroscopy method for the determination of the wax precipitation temperature (WPT) of crude petroleum, and the estimation of the amount of precipitated solid wax material present in crude petroleum at temperatures below the WPT is being applied to generate solid-liquid equilibria (SLE) data for mixtures of heavy hydrocarbons in a light solvent. These mixtures are ultimately intended to be representative of Fischer-Tropsch (FT) reactor products. The FT-IR spectroscopy method was originally demonstrated on a mixture of *n*-alkanes (C_{20} to C_{30}) in decane solution with known SLE from the literature. Currently this project is developing a similar data set for a mixture of *n*-alkanes (C_{30} to C_{50}) in decane solution under low-pressure conditions. FT-IR data for this new model oil has been generated and the creation of a comparative database using traditional filtration with correction of solid phase amounts for occluded liquid phase materials by gas chromatography is underway. The next step for this project will be creation of another model oil mixture representative of FT reactor products, and collection of SLE data for this model oil mixture under high-pressure conditions using a combined (IR, near-IR, UV) spectroscopy approach.